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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,669	02/13/2002	Kevin E. Boyle	TRW(RG)5832	2678

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EXAMINER

YEAGLEY, DANIEL S

ART UNIT	PAPER NUMBER
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3611

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/075,669	Applicant(s) BOYLE ET AL.	
	Examiner Daniel Yeagley	Art Unit 3611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-57 is/are pending in the application.
- 4a) Of the above claim(s) 37,38,50 and 51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-36,39-49 and 52-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election of claims 31 – 36, 39 – 49 and claims 52 – 57 drawn to elected species II is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement in Paper No. 5, the election was treated as an election without traverse (MPEP § 818.03(a)), hence claims 37, 38, 50 and 51 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Drawings

2. The drawings are objected to because figure 6, numeral “54” should be change to numeral –50--. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. However, the disclosure is objected to at least because of the following informalities:

Page 1, line 14, change numeral "4,846,606" to --4,856,606--.

Page 5, line 1, change "Fig.3" to --Fig. 13--.

Page 6, line 6, delete the words "shown schematically at".

Page 8, line 9, change numeral "60" to numeral --66--.

Page 12, line 17, change numeral "108" to numeral --106--.

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 53 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 53, line 3, the term "said drive member" lacks antecedent basis.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3611

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 45 – 49, 52, 53, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmura et al '494 in view of Cartwright '742.

Ohmura shows a steering system having steerable rear wheels (figure 1), wherein the steering system comprises an axle (housing 40) having end portions that support rear wheels 6, wherein an intermediate portion of the axle defines a chamber (figure 2) that supports a steering member 30 that is free of rack teeth that moves axially relative to the housing and a ball nut 34 that is associated with a screw thread portion 84 (column 3, line 24-35, column 5, line 11-13), an electric motor outside the chamber that is connected with the axle that includes a motor control circuitry operative to cause a generation readable as being back EMF in an electric motor 32 to resist movement of the steering member toward a straight ahead position (column 3-5, line 53-10), at least one drive member 88 extending through an opening in the axle housing spaced from an intermediate portion of the axle and connected between the motor and the ball nut for rotating the ball nut to drive the steering member axially upon actuation of the motor as shown in figure 2 and further includes a single spring assembly 98 disposed in the chamber in the housing 40 which biases the steering member toward a straight ahead position that includes fixed stops 100,102 disposed in the chamber and movable stops 90,92 that are movable relative to the fixed stops (column 5) and includes a locking member 46 capable of locking the steering member in a straight ahead position (column 617-21) but lacked the takeoff assembly and steering linkage as claimed.

Cartwright discloses a steering system comprising an axle housing supporting wheels (figure 2), wherein an intermediate portion of the axle defines a chamber (figure 3) supporting a ball nut 86 fixed axially therein and associated with a screw thread portion 84 of an elongated steering member 50 supported in the chamber of the axle similar to the steering system of Ohmura, and wherein the steering member of Cartwright steering system further shows the art of utilizing a steering system incorporating a takeoff assembly connected to the steering member with a portion projecting from an opening in the axle housing (figure 3) wherein a piston member is connected with the steering member and a portion of the takeoff assembly projects radially from an intermediate portion of the axle housing with a first and second steering linkage connected with the projecting portion for transmitting movement of the takeoff assembly to first and second wheels as claimed

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the spring biased rear steering system of Ohmura and incorporated a piston type takeoff assembly with center extending steering linkages extending from an opening in the intermediate portion of the axle housing such like that shown by Cartwright to further enhance the steering system of Ohmura utilizing a takeoff assembly and steering linkage to further improve the steering apparatus to effect turning of the steerable wheels as suggested by Cartwright (column 1).

8. Claims 31 – 36, 39 – 43 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmura et al; '494 as modified by Cartwright '742 in further view of Ikeda et al '578.

Art Unit: 3611

Ohmura as modified by Cartwright as stated above discloses a steering system having steerable rear wheels and having a steering member 30 and ball nut 34 supported in a chamber of an axle 40, which includes at least one drive member 88 extending through an opening in the axle housing spaced from an intermediate portion of the axle connecting the ball nut with an electric motor connected outside the chamber of the axle which includes a locking member and further includes a single spring assembly 98 and stops 90, 92 disposed in the chamber for biasing the steering member toward a straight ahead position and as modified by Cartwright showing a takeoff assembly and steering linkage as claimed and wherein the axle has end portions supporting rear wheels 6 but failed to show the axle having end portions suspended by springs as is commonly known in the art.

Ikeda discloses a steering system comprising an axle supporting wheels (figure 2), wherein the end portions of the axle are suspended by springs 13 as claimed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the rear steering system of Ohmura as modified by the takeoff assembly and steering linkages of Cartwright steering system extending from an opening in the intermediate portion of the axle housing with axle end portions of Ohmura axle being suspended by spring supports such like the steering system as shown by Ikeda; for example, to obviously provide a spring biasing support means between the vehicle and the rigid axle as is old and well known in the vehicle suspension art to provide suspension for better ride characteristics as is well known.

Art Unit: 3611

9. Claims 44 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmura et al; '494 as modified by Cartwright '742 in further modified by Ikeda et al '578 in further view of Jung et al '774.

Ohmura as modified by Cartwright as further modified by Ikeda as stated above disclosed a steering system having steerable rear wheels with a steering member and ball nut supported in a chamber of an axle, which includes at least one drive member 88 extending through an opening in the axle housing connecting the ball nut with an electric motor connected outside the chamber of the axle but failed to show the drive member being a belt that extends part way around the ball nut and part way around an output member connected with the electric motor as claimed.

Jung discloses a rear wheel steering system that utilizes a drive belt that extends part way around the ball nut and part way around an output member connected with the electric motor as claimed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the rear steering system of Ohmura as modified by the takeoff assembly and steering linkages of Cartwright steering system as modified by the spring suspended axle of Ikeda with an alternative type drive means that incorporates a drive belt in place of the gear drive member of Ohmura motor driven steering system simply as an alternative transmission means dependent upon users preference to drive the ball nut of the steering system of Ohmura, wherein drive belts are old and well known drive means in the art.

Response to Arguments

10. Applicant's arguments filed 12/12/03 have been fully considered but they are not persuasive. Ohmura clearly discloses an axle with a steering member and ball nut disposed in the axle having an electric motor is connected to the axle and as obviously modified by Cartwright steering system which clearly disclose the features of a take off assembly as stated above as broadly claimed and are deemed readable on the claims as now claimed.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Art Unit: 3611

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Yeagley whose telephone number is 703-305-0838. The examiner can normally be reached on Mon. - Fri; first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lesley D Morris can be reached on 703-308-0629. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D.Y.


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